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Waste in the Manufacture of Men's and Boys' Ready-to-Wear Clothing¹

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Management Engineer

THE men's and boys' ready-to-wear clothing industry is one of the important industries in the United States. While not comparable in magnitude with the railroad, iron and steel, building and certain other industries, in 1920 its 3,504 manufacturers, employing more than 173,000 workers, were distributed among 42 states and 439 localities. The industry's product, consisting of men's three-piece and two-piece suits, boys' suits, men's and boys' overcoats, rain coats, office coats, automobile dusters, sporting suits, fancy vests and the like, is equivalent to between fifty-eight and seventy millions of three-piece suits a year and represents a retail value of from a billion and a quarter to a billion and a half dollars.

HOW THE INDUSTRY IS NOW CONDUCTED

This industry has passed through a number of changes, both in the nationality of its merchant-manufacturers and workers and in the form of its organization. These must be noted to understand the existing problems of waste.

Originally, it is said, the merchant-manufacturers were Spanish Jews and the artisans, French Jews whom the former despised. In the course of time proprietorship passed to the French Jews who despised their employes, the Italian Jews. In their turn the Italian-Jew proprietors despised the Ger-

man-Jew artisans, and now the German-Jew proprietors despise their Russian and Polish-Jew employes. Here and there a Russian Jew has obtained proprietorship, while into the body of workers has come a large element of non-Jewish Italians, Bohemians and Lithuanians.

The people who have had the responsibility of conducting the industry have been, for the most part, not manufacturers, but speculative merchants who buy cloth, have it cut into garment parts in their own cutting departments and send these parts to outside people to be made up into finished garments. Originally, these parts were distributed among the work people at their cramped, ill-ventilated lodging places, mostly in tenement houses, where they were saturated with cooking odors, slept on by the children and made up into garments. A slatternly old Jewish or Italian woman carrying a bundle of garments on her head is even yet a familiar sight in New York City. Much of the "finishing," buttonhole making and button sewing, is still done under the "sweatshop" system. Such work is paid for "by the piece."

This sweatshop system developed into the sub-contracting system. Some of the more enterprising of these home-workers turned their tenement apartments into "shops" by knocking out the partitions, installing a half dozen sewing machines along a bench on one side of the room, a row of seats for hand-workers along another bench on the other side, and tables with hand-pressing boards near the windows. They hired their less enterprising

¹ A part of the subject matter and all of the charts in this article are taken from a report submitted jointly by M. L. Cooke and the author to the American Engineering Council's Committee on "Elimination of Waste in Industry." (Ed.)

fellow-workers to assist them, paying them by the piece, and contracted with the merchant-manufacturers to make up garments for them at a stipulated price per garment. Low piece-rates were combined with long hours. The workers received possibly the least money per week of any industrial class in the United States.

In New York City, in more recent years, since the union has become a powerful factor, piece-work was abolished in these contracting shops. Eventually it gave place to the "week-work" system in which the worker is paid on the basis of time he works and not on the basis of what he accomplishes in that time. During the transition there was a period of so-called "week-work with production standards" in which each worker was each day assigned a "stint" or definite amount of work which he had to complete in order to earn his day's pay. These stints were set arbitrarily by the proprietor and were so great as to keep the people working until eight and nine o'clock at night. Finally, the workers rebelled and abolished the stints. Since that experience, the idea of either piece-work or production standards has been anathema to the clothing workers of that city.

Most garment making in Greater New York is done in these contracting shops. There were nearly two thousand of them in February, 1920, as against less than one hundred tailoring shops owned and operated directly by the so-called clothing manufacturers. Most of these have been set up in former four and five room tenement apartments in Manhattan and Brooklyn and are operated by from a dozen to forty or fifty workers. A large portion of these shops are exceedingly dingy and unsanitary. Garments mop up the dirt from the floor. In one case, at least, a visitor found the proprietor ill, asleep on

a pile of coats. If the wearers of ready-made or of high-priced Fifth Avenue made-to-measure garments could know what exposure their garments have had to dirt, perspiration and disease germs, they would fumigate them with formaldehyde before wearing them.

The so-called "clothing manufacturers" of New York like the sub-contracting system. It offers them freest play for competitive speculation. It enables them to compete in prices and at the same time safeguard themselves by skilfully playing contractors against contractors so as to save the expense of getting the garments made. It permits them to accommodate themselves with the minimum risk and inconvenience to the highly seasonal demand for their product, concentrate their year's manufacturing into two short periods of from ten to eighteen weeks each and shut down with minimum loss from idle investment and overhead expense. The only "factories" they have to shut down are their own cutting departments. They assume no responsibility for these contractors and their employees during the other sixteen to thirty-two weeks. This contracting system will not give way to direct manufacture in New York City until the workers give better service in the manufacturer's shops than they do in contractor's shops—the reverse of the present situation.

Sub-contracting is a feature of all large clothing markets. Even the Clothercraft Shop did not take over its vest making until late in 1919. However, in Baltimore, Chicago, Cleveland, Philadelphia and Rochester, steps have been taken toward the development of large manufacturing institutions that do all the work of making a garment and use sub-contractors only to supplement their own manufacturing facilities. There are now two or three who pride themselves on doing all their

own manufacturing. The industry is developing in the right direction.

The character of management and the operating ineffectiveness in this industry are all that one would infer from the foregoing description. One establishment in it, however, ranks so high in management as to give a wonderful example of what the others could be if their proprietors had the necessary vision, faith, will, and could rid themselves of the notion that "my business is different." This plant is far from typical and we shall refer to it again only incidentally. A large mass of ephemeral plants are as badly managed as conceivably possible. Most of the manufacturing institutions referred to above have attained mediocre systematic management, while three of them are trying to install scientific management.

It is merely stating a truism to say that the production can be carried on effectively only when each operation contains only necessary work and is performed with the best available appliances, under the most favorable operating conditions, by persons adapted to the work, skilled in and using the most effective known method.

Men's and boys' ready-to-wear clothing for the most part is not manufactured under these conditions. The work content of operations is not standardized. To cite an extreme case, the writer and his assistant found that forty-five per cent of all the work being done in the "finish pressing" operation in a certain coat shop was unnecessary. Out of fifteen pressers no two were doing identical work. Furthermore, each presser walked an average of 150 feet with each coat separately, fifty feet to deliver it to the examiner when he had finished it, fifty feet to the work-ahead pile for the next coat and fifty feet back to the pressing table. A recognized authority in the industry

who has gone through the process of standardizing coat and pants shop operations estimates that, on the average, twenty-five per cent of all the work traditionally done is unnecessary.

Substituting the most effective method for the variety of inferior methods offers probably the largest direct opportunity for augmenting the production per man-hour. In so simple an operation as creasing arm-hole seams (a part of "finish pressing") six different methods were found in use among eleven operators working side by side. The best of these methods turned out the work more than two and a half times as rapidly as the poorest. The average productivity of all was forty-three per cent under that of the best. The output and piecework earnings of a certain group of basting pullers was doubled by teaching them the method of the best basting puller in another shop. The authority referred to above states that such waste figures apply to the whole garment making process.

Appliances are not standardized. Machines of a variety of design are found used in the same operation in the same shop. High speed machines are not used in those operations to which they are adapted. Indeed, in the division of the whole process into operations, so much hand work is combined with machine work that the machines do not ordinarily run more than one minute out of six. On the other hand, one manufacturer keeps his machines going six minutes out of ten. Machine or work place tables are too short, too narrow, too high or too low to afford sufficient elbow room and comfort for unhampered operation. Out of scores of establishments visited during the writer's twenty months' contact with this industry only one manufacturer was found who had written standard specifications for these things, based on study.

Furthermore, machines are not maintained in proper operating condition. For instance, in one factory 1,100 operatives are served by two machinists who are kept on the jump from morning until night making emergency makeshift repairs out in the shop while the workers look on and others, idle, await their turns. They state that they do not have time to take a machine into their repair shop and give it a proper over-hauling. Nor does their repair shop contain a single planer, speed lathe or drill press. The sewing machines are in run down condition. These operatives on piece-work lose production and earning power through the frequent breakdowns, the low speeds of their machines and the interruptions caused by frequent thread breaks that come when the internal mechanism is out of proper adjustment. A test in this shop showed that the speed of machines on the same shafts and same operations ranged from 2,250 down to 1,750 stitches per minute, whereas, in another establishment, the machines went 4,000 stitches per minute. Discouragement and dissatisfaction of pieceworkers under such conditions lead to labor turnover.

The above conditions prevail in a certain manufacturing institution. The conditions in the non-institutional little ephemeral shops and contractors shops are left to the reader's imagination. Certain institutional manufacturers do maintain well equipped repair shops and an adequate stock of spare machines. Instead of waiting until machines break down to repair them, they divide all the machines into comparatively small groups, and put each group on a time schedule, so that at regular stated intervals each machine is replaced from the spare stock, taken into the repair shop and the internal mechanism inspected and restored to proper operating condition. This not only

largely forestalls and prevents actual breakdown, but maintains all machines in better operating condition.

THE IMPORTANCE OF STANDARDIZATION

Without standardization of appliances, conditions, quality and work content, and of work method no valid performance standard can be determined. The great mass of clothing factories are without any performance standards. Some, indeed, do use a stop watch in timing operations for the purpose of setting piece-rates. However, these rate-setters leave the same variable appliances, variable machine speeds, variable lengths of stitch, variable methods that they found—or rather, did *not* find. How can such piece-rates be just? Such "studies" cannot result in performance standards. The piece-rates based on such "timing" are set for the operations in name only, there being no supporting written description of the appliances, conditions, detail of work content and methods whereby to define the operations to which the piece-rates refer. In consequence, the pieceworkers successfully carry on a continuous process of reducing the work content of operations, skimping on quality, and yet maintaining the same piece-rates. The alleged performance standards of other manufacturers that are based on "average past performance" are, of course, equally invalid because they, too, do not refer to definite methods and standardized conditions.

The movement toward setting piece-rates on the basis of such "time studies" was accelerated recently by Impartial Chairman Leiserson's award which permits the Rochester manufacturers to place on piecework the fifty-five per cent of their operations that hitherto had been on week-work. In view of the necessity of getting quickly on-

to a basis that will preserve the operatives' weekly earning power and yet effect a substantial reduction in the unit cost of production, this practice may be condoned if it is distinctly and mutually understood that this is merely a transition step. Likewise, the remnant of the Clothing Manufacturers' Association of New York and the Amalgamated Clothing Workers of America have agreed, in their recent settlement, to the principle of "week-work with production standards" to be determined by negotiation and mutual agreement or by arbitration. The manufacturers individually have been negotiating such standards with their respective shop committees. These standards take the form of specifying the number of workers in each operation in the shop, the wage-rates for forty-four hours work and the number of garments to be delivered each forty-four hours by each section or by the shop as a whole. These agreements really guarantee the manufacturer a minimum rate of output and a wage cost not exceeding a certain maximum. If the output falls below the specified rate, wage-rates are to be scaled proportionately. However, if it rises above this rate wage-rates are not to be raised. This seems an unavoidable step under the circumstances. Moreover, it seems just that performance standards should be determined with the consent and active coöperation of the work people rather than by the arbitrary judgment and fiat of the employer. However, both sides should distinctly recognize that even standards based on mutual agreement cannot long be satisfactory unless they are also based on careful study and standardization of operation content, appliances, conditions and operating method, and, therefore, that the present is a transition period.

Properly determined and properly

administered performance standards are a very valuable device both for conducting human relations on a mutually satisfactory basis and for planning and administering production. Under the piecework system they are the basis of just piece-rates. Under the week-work system they are the basis of a just measurement of the individual worker's performance and of the adjustment of his wage-rate to his capacity. Only on the basis of properly determined performance standards can wage scales be determined and administered with mutual satisfaction to employers and employees. One concern has been operating under a system of "week-work with production standards" for several years.² The week-work rates refer to these standards. Indeed, for many operations there is a series of progressive standards to each of which a wage-rate corresponds. A record is kept of each worker's performance and compared with the standards. In this way each worker grades himself and determines his own wage-rate by his performance.

By constantly checking actual performance against the standards and promptly investigating the causes of failures to attain standard, the manufacturer can quickly detect and rectify unstandard conditions as they creep in. By encouraging operatives to complain when conditions are not standard, and by promptly and sincerely investigating such complaints, rather than disregarding and discouraging them, valuable coöperation can be obtained in maintaining standard conditions. Performance standards enable the work waiting at each operation to be expressed as *hours of work*. This is a valuable aid in planning the daily dis-

² These standards, while determined by mutual agreement, are not based on careful, detailed studies and standardization of processes, conditions, methods and the like.

tribution of workers so as to prevent both congestion of work at some operations and failure of the work supply at others. All sales orders can be expressed in terms of hours of work on the basis of which a balance of work-ahead record can be maintained. Production can be scheduled for months or a season in advance. Delivery promises can be made that can be kept and the sales management can be guided in pushing for more business or refusing orders, in pushing or neglecting this or that class of model. Production can be planned for an entire season. The writer found a certain manufacturer of women's suits planning in December the origination of two new models in order that his plant could continue producing after May first suits of the various model classes in the same proportions for which their shops had been organized. In the realm of expansion the manufacturer can so plan the size of his plant and operating force as to take care of a given assured volume of business by continuous operation. These, together with a scientific make-for-stock policy based on an intelligent use of business statistics, make it possible to eliminate the seasonal wave feature of manufacturing—of which more will be said farther on.

PLANNING AND ADMINISTERING FACTORY WORK

The great majority of clothing establishments lack even the mechanism that is necessary for planning and administering work effectively. Some planning is done by shop executives or workers as an incident to other work. The analysis of sales orders, the classification and assemblage of the items into cutting orders and the delivery of piece-goods to the cutting floor must be planned by the management. However, the division of the cutting order into lays, the selection of the

specific bolts of piece-goods for the specific lays³ and the sequence in which they shall go into the lay, is usually planned by the workman on the cutting floor. Recently, a certain large house transferred all of this work to a planning department. Since then each order that was sent into the cutting department has been for a single lay. The piece-goods to be used are chosen by reference to the record of their widths and lengths; the length of the lay is specified, also the sequence in which the various pieces are to be put into the lay. The data necessary for this planning consist of an up-to-the-minute piece-goods record, not only by design but by the individual bolt, showing shrunk width and unused length and the measurements made on a set of standard lays made on paper before the manufacturing season opened—three widths for each model and practical combination of sizes. When the lay is built, instead of having a workman lay in and mark the patterns on the top layer of cloth as was the former practice, a carbon copy of the original standard or master lay is pinned to the top layer. Finally, this concern uses past experience and a tabulation of the items of sales orders received during the first ten days of the sales season to anticipate the distribution of its total sales of the season among the various models. This planning, this labor saving device, and the manufacturing to fill anticipated rather than actual sales items, have together increased the output per man hour of this concern's cutting department sixty per cent. At the same time they have saved a considerable amount of cloth.

In most tailoring shops there are no dispatching stations for recording the progress of work and giving out work assignments. There are no work tickets and, consequently, no route sheets of

³ Piles for cutting into garment parts.

progress records for the various manufacturing lots. No record is kept of production of the individual worker or the operation or of the balance of work ahead at each operation or of the plant as a whole. Lots of garments introduced at the beginning of the process just drift through without anybody's knowing where they are. In compiling the finished output of a certain shop the writer found it to be the rule that the last garments of any specific manufacturing lot to reach the finished state were more than a week behind the first garment of the lot. Production is measured only in shipments of completed garments to the finished stock room. Operatives either hunt up their own work, or the foreman and his assistants, combining the function of shop porter with that of hiring, instructing, disciplining, wage-adjusting and a multitude of other duties, watch the supply of each worker in their jurisdictions and find and carry work to him. Congestion of work at some points and idleness at others are the usual conditions.

Most of the "institutional" plants have work tickets with which to record individual piece-work performance or individual week-work performance. The former, however, usually consist of piece-work coupons, lot or individual garment, which are retained by the operative and turned in by him to the payroll department once or twice a week. They have no value for other than this one purpose. In these plants there is usually a record of the garments, by lots, that pass certain six, ten or fourteen points in the factory. However, in these rarely is there a complete record of the progress of each lot and of the production and balance of work ahead of each operation. The writer spent much time in the shops of one of these institutions. There was no visit to any shop during which he did not

observe a number of operatives, even whole sections of them out of work. The only wigan sewer spent a third of an afternoon sitting with folded hands; all of a small section sat on their work benches in idleness; three out of twelve operatives were idle during the whole of some ten or fifteen minutes the writer was observing a certain pants operation; thirty or more vest buttonhole makers delivered their finishing work (one vest at a time assigned to each worker), wrote their names in a column on a large sheet of paper to establish the order of service, and sat idle until more vests arrived from the previous operation and their numbers were called. Forty-five collar makers did a similar thing for hours and then were sent home at two o'clock in the afternoon. These are a few samples of what was usual all over the shops—even at the peak of the manufacturing season when the production manager was keeping every foreman on a hot griddle because he was not getting out garments rapidly enough.

Besides performance standards, two indispensable requisites of economical shop operation are first, an up-to-the-minute record of the production in each operation and of the amount of work waiting to be done ("balance of work ahead"), and second, versatility of the workers. Without such a record, congestion of work is bound to occur at some points and running out of work is bound to occur at other points before shop executives can become aware of their imminence. With such records the trend of affairs at each point can be known hours or days ahead and adequate measures taken to maintain the even flow of work. These measures consist for the most part of planned transfers of workers. Such transfers are unavoidable if congestion and idleness are to be avoided. Only in a factory so large that it could supply the

whole world, with a perfect attendance, with absolutely no labor turnover, with the various models and sizes of product fed in invariable proportions, and with perfect maintenance of equipment, could the work force in the various operations be so proportioned as to dispense with the frequent reapportionments effected by transfers.

Two manufacturers, in particular, have done very well in these respects. One operates under scientific management; the other is endeavoring to install it. Both have divided their shops into sections of convenient size, each served and directed by an order of work station. Both have work tickets to record individual production, one piece-work, the other week-work with production standards. Both have a suitable set of route cards for each manufacturing lot on which the one keeps an up-to-the-minute, the other, an up-to-the-hour record of the progress made on that lot. Likewise one has an up-to-the-minute, the other an up-to-the-hour, record of the production in each operation and of the balance of work ahead of it. The one, through a policy of grading and rating the various operations according to skill involved and of developing the all-around skill of its workers, has developed a very versatile and mobile work force and re-distributes them each day so as to "balance the shop." He then avoids congestion at any point by setting a production quota for the day that will occupy the "weakest link" the full work day—something that can be done only by having both properly determined performance standards and a recorded knowledge of the capacities of each operative. Production in each operation is stopped as soon as the day's quota has been completed in it. The other maintains a separate "flying squadron" of versatile workers and plans the transfer of these each day on

the basis of the balance of work ahead and production record.

All of this implies centralized planning to originate and plan for manufacturing orders, prepare the administrative stationery, collect and interpret reports, plan transfer and the like. Once such a brain is established and consciousness is awakened, it will not be content with the subject matter that is referred to it but will direct its attention forward to the whole work of the season and of future seasons. Manufacturing planning, sales planning, financial planning, both for the immediate and the more remote future, will become interlinked.

INTERMITTENT EMPLOYMENT—THE SEASONAL WAVE FEATURE

The most important waste, from the viewpoint of the workers, remains for discussion. It is the seasonal wave feature of the industry that results in a large degree of unemployment during two periods each year. Taking the fluctuations in the employment of cutters—fluctuations in hours worked below the full week as well as fluctuations in the numbers of cutters on the payrolls—as an index to the fluctuations in the employment of all clothing workers, the payroll data of eight representative establishments in various parts of the United States showed that the average employment, exclusive of overtime, is thirty-one per cent under that at the peaks of the busy season.⁴ With one concern the average is forty-two per cent less than the peak. Charts 8, 9 and 10, pages 60-61, portray the fluctuations in the number of cutters in the employ of three of these "manufacturing institutions." Representation of the half-time or less worked during the slack seasons would make the valleys much deeper.

⁴ These data cover the period from January 1, 1917 to April 17, 1920, but do not cover the present industrial depression.

Unemployment at the depth of these slack seasons reaches as high as eighty and ninety per cent in some of these institutions, while many small plants shut down altogether. This seasonal wave manufacture means that on the average thirty-one per cent of clothing plant capacity is wasted. In other words, clothing plants are over-equipped forty-five per cent as compared with what would be necessary if the same volume of manufacture were spread uniformly over the year.

How nearly thirty-one per cent of the possible productive time of the workers is thus wasted cannot be stated because there are no means of ascertaining what these displaced workers do. No doubt many of them migrate to the tailor-to-the-trade houses, whose seasons partly dove-tail with those of the ready-to-wear houses, or to other fill-in employment; but with the best they can do there must be great loss of earning power. Were these workers only inanimate tools the waste might stop with that. However, they are living beings with family ties, anxieties, capacity to suffer and minds with which to interpret, form theories and adopt courses of action.

One consequence of their seasonally recurring anxieties and sufferings is a vast fund of antagonism toward their employers and toward employers as a class which may be summed up under the designation, "industrial ill-will." Another is the concrete, practical, though fallacious, industrial philosophy called the "lump-of-labor" or "make-work" theory. This is the belief that "there is so much work to be done" and that the sensible course for workers is to stretch it out and make it last throughout the year.

Workers' antagonism and this philosophy express themselves in various ways. The introduction of labor saving machinery is opposed. Discipline

is largely taken out of the hands of employers and centered in the union machinery. There are local movements to substitute week-work for piece-work and to abolish work-tickets in the week-work market. Likewise, all mechanism for recording individual performance is opposed. Suspicion of the manufacturer's motives, in connection with any mechanism he may try to install, hampers and even prevents the installation of the mechanism necessary for the most effective planning and administration of factory work.

This seasonal phase of the industry thus not only constitutes one of the greatest wastes but also constitutes the one big problem that confronts the worker's union. Workers are demanding a satisfactory solution of this problem. Furthermore, until they see satisfactory progress being made toward its solution, their "industrial ill-will" will not only grow, but will retard and, in some places, block the introduction of those measures that are necessary for eliminating other wastes. The solution, however, is not to be found in the measure that the workers have applied or advocate, but in seeking and removing the cause.

The chief cause of seasonal unemployment is the almost universally prevalent sell-then-make basis of manufacture and this in turn is largely dictated by the excessive variety in the styles of product. The trend in recent years, due to the desire of the manufacturers to stimulate additional demand and their fear of losing ground to competitors, has been toward an increasing multiplicity of styles of young men's suits and of varieties of cloth. An illustration followed through to its consequences will be enlightening. One concern offered its customers, in the heavy weight season of 1920, thirty-one models of over-coats, twenty-nine models of sack suits, each in three styles of

lining construction, three combinations of lining materials and nearly 1,100 varieties of cloth. Thus, each customer had a free choice among 278,000 possible combinations. While this case is extreme, it is only the extreme of a widespread trend. (See Diagram 1.) This concern's total sales were less than that figure so that had its customers exercised among them all possible choices, every suit made would have had to be cut and processed separately. As a matter of fact, the average size of its manufacturing lots was twelve garments. There were very few lots of more than twenty and far more lots of three garments than of any other number.

Thus, the first consequence of this great variety was very small scale production. Although this concern manufactured 400,000 suits a year, they were put through in these minute lots.

This kind of production has two important consequences. First, the direct labor per garment is unnecessarily great because of the very large proportion of those items of work that are done but once for the assignment. It takes as long to get work, open bundles, arrange piles of parts, read making instructions, change or set gauges, change thread, tie up bundles, deliver finished work and the like for a lot of three or twelve as for a lot of one hundred. Further, there is the production loss that comes from frequent interruptions of the rhythm of the operatives' work. In this case the work assignments were so short that one worker out of every five was thus interrupted at least once in every six minutes, and two out of every three were interrupted from one to six or seven times every half hour.

DIAGRAM 1

CHARTS SHOWING DISTRIBUTION OF SALES AMONG MODELS

Excessive variety of product keeps production on a small lot basis. This variety coupled with a policy of manufacturing only to fill orders received also causes production to come in marked seasonal waves alternating with slack seasons of extensive unemployment.

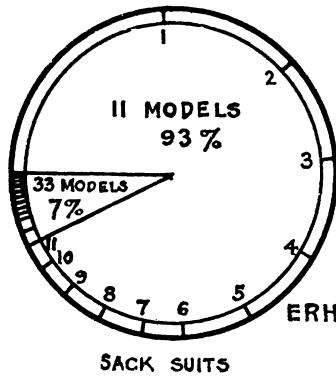


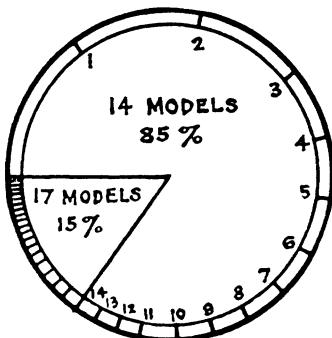
CHART 1

One manufacturer offered his customers choices from 29 stock models of men's and young men's sack suits and also made up suits in 14 special models designed by certain customers. Each of these was offered in three styles of lining construction, three combinations of lining material and in over 1,000 cloth styles.

The effect of this great variety upon the size of manufacturing lots is shown in chart 5. The marked wave character of this firm's employment is pictured in chart 8.

That the public does not really demand so great variety is evidenced by the fact that 11 of these models account for 93% of the total sales.

The sales of 25 of the remaining models are so small that they cannot really be represented in this chart.



SACK SUITS

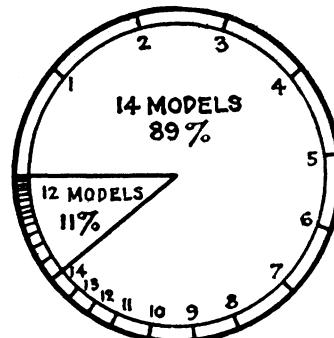
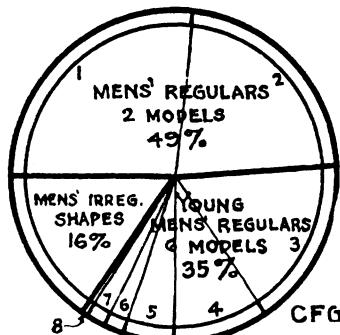


CHART 2

OVERCOATS

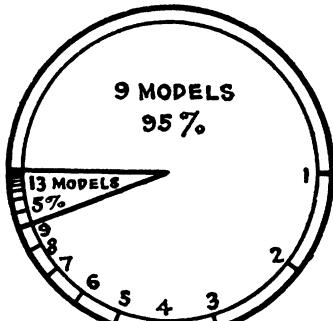
This manufacturer offers 31 models of sack suits and 26 of overcoats. But the great bulk of demand concentrates on a comparatively few models.



SACK SUITS

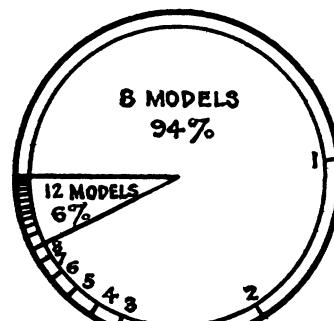
CHART 3

This manufacturer offers only two men's and six young men's suit models, each in less than 300 cloth styles. Two-thirds of his sales concentrate on three models. This enables him safely to make up suits of these models for stock between seasons and thus operate his plant continuously at full capacity; also to cut in lots averaging 128 suits each.



SACK SUITS

CHART 4



OVERCOATS

This manufacturer offered 22 models of sack suits and 20 models of overcoats, each of which was offered in over 1,000 styles of cloth. One model in each accounts for nearly or quite half of all his business. He has a wonderful opportunity to eliminate slack seasons by manufacturing these models for stock.

Second, such small-sized lots make effective shop planning and administration so expensive that manufacturers dispense with it. There are from 80 to 150 operations involved in making a sack coat, depending on how the whole process is divided up. To provide individual work tickets, order of work tickets, a set of route cards, adequate inspection and move orders for lots of one, two, three, four, five, or even twelve garments, means prohibitive expense. Most of this procedure involves no more expense for a lot of one hundred or five hundred than for a lot of three. Furthermore, less time of operators and clerks will be consumed in changing assignments of work in the case of large lots, for with small lots and frequent changes there is bound to be a large amount of awaiting turns. With large lots the expense of such mechanism is negligible, counterbalanced many times over by the benefits. With small lots the expense looms so large relatively that the manufacturer has not the courage to incur it. Hence excessive variety of product bars effective factory management.

The second consequence of this great variety is that it practically forces the manufacturer to the sell-then-make basis of manufacture and through it puts manufacturing at the mercy of the seasonal demand for the product. This is a negative, easy-going policy in any event. However, with this great variety of style offered, with the consequent small sales of many of the models—in one case twenty-five out of forty-three models accounted for from less than three-tenths of one per cent down to two-thousandths of one per cent each—without the tabulation and statistical study of sales data that is necessary for any dependable forecast of the probable relative popularity of the various styles, sell-then-make becomes the only safe manufacturing basis.

How intense this seasonality is, we have already seen. However, it is caused not so much by the ultimate purchasers' bunching their demands in the early autumn and just before Easter as by the retail dealer. He does not want to receive his merchandise before the beginning of his sales season. Partly through established custom and partly through fear of being a bad guesser on the trend of fashion—a fear to which the excessive variety itself makes a large contribution—he does not want to order too long in advance. For the same reason the manufacturer waits until the last possible moment to make final decision concerning the models to be shown. Consequently, receipt of sales orders precedes the opening of the new retail season by too brief a period, and manufacturing must be bunched.

A study of sales statistics indicates that neither the consuming public nor the dealers really demand such excessive variety of styles. In one case eleven out of thirty-one sacksuit models accounted for seventy-eight and one-fourth per cent of the total sales. In another, nine out of twenty-two models accounted for ninety-four per cent, and one model alone accounted for fifty per cent. In a third, eleven out of forty-three models accounted for ninety-four per cent of the sales, while the sales of twenty-five out of the remaining thirty-two models ranged from less than three-tenths of one per cent down to two-one thousandths of one per cent each. (See Diagram 1.) Most of the multiplicity seems to represent the manufacturer's effort to entice a little additional business—business that must be unprofitable on such a minute scale.

As for the sell-then-make manufacturing basis, all large clothing houses have always done a considerable amount of making for stock during slack seasons.

They have simply reduced their production to fifty per cent or twenty per cent of normal. An intelligent study of their sales would enable them safely to make for stock up to their full normal output throughout the year. The great bulk of sales, seventy-one per

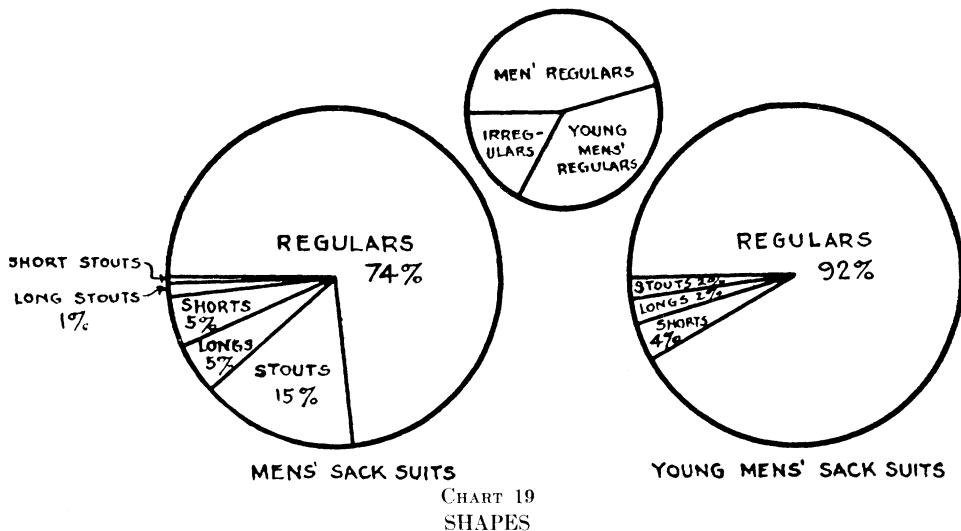
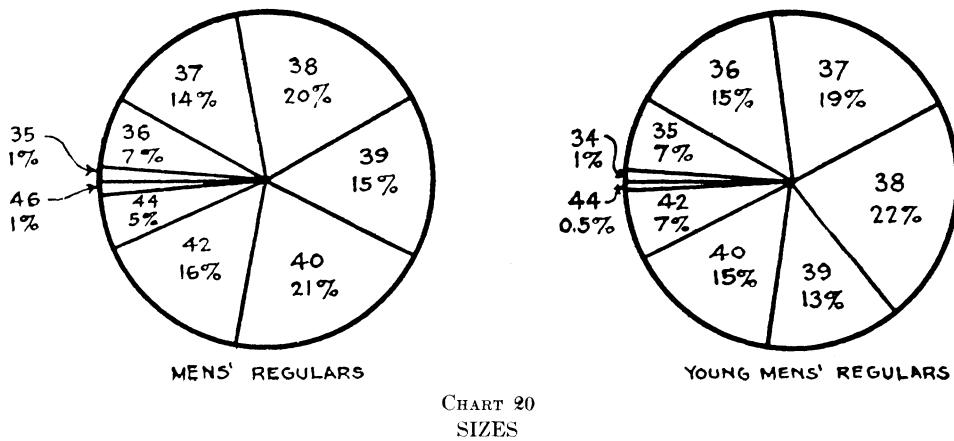
cent of men's sack suits and eighty-nine per cent of young men's, concentrate on the so-called "regular" forms and largely on five sizes. (See Diagram 7, Charts 19 and 20.) In every manufacturer's list there are two or three models that are persistently

DIAGRAM 7

CHARTS SHOWING DISTRIBUTION OF SALES AMONG DIFFERENT SHAPES AND SIZES

The great bulk— $86\frac{1}{2}\%$ —of the demand for men's and young men's ready-to-wear sack suits is for the "regular" or standard shape or form. Men's "regulars" concentrate largely on 5 sizes, namely; 37, 38, 30, 40 and 42. Young men's regulars also concentrate on 5 sizes, namely; 36, 37, 38, 39 and 40.

Manufacture of regulars for stock in conservative styles in these sizes and in a range of tasty (not flashy) suiting is safe up to such limits as fully to bridge the traditional slack sales seasons.

CHART 19
SHAPES

much better sellers than the others season after season over a fairly long period. Likewise, there are a number of good (not freakish and flashy) cloth styles which the manufacturer can practically be sure of selling in considerable quantities. These are the materials with which to bridge the slack seasons by manufacturing for stock.

Several houses have found that the proportion in which their sales of the first two weeks of the sales season divide themselves among the various models are substantially the same as the proportions for the entire season. On this basis they estimate the distribution of their total sales, manufacture to fill *anticipated* sales orders during the first half of the manufacturing season and still have time in the latter half to correct any discrepancies between the anticipated and the actual sales. This enables them not only to maintain an even flow of work but to plan all cutting and manufacturing so as to secure economy of cloth and labor. This plan has been followed with great success by a certain large house that manufactures women's suits—and compared to the variety and rapidity of change in style in women's suits, changes in men's wear are not mentionable. What can be accomplished in the field of women's garments can also be accomplished in the field of men's garments and has been accomplished by at least two concerns.

What seems to be needed is a courageous, constructive sales policy, that (1) confines the business to from five to ten well chosen models, in 200 to 300 cloth styles, expressing all the variety that the consuming public can appreciate; (2) divides the country into sales territories with the assignment to each of a definite quota not only of all garments but of each model; (3) stands for a vigorous, positive salesmanship instead of the order-accepting kind,

backed up by effective national advertising to carry out the sales policy and sell the quotas.⁵

For instance, one concern offers but eight models of sack suits, each in less than 300 cloth styles. It is able to cut in lots averaging 128 garments and one cloth style each. Contrast this with average lots of twelve garments cited in a foregoing illustration. (See Diagram 2.) Two-thirds of its sales concentrate on three of these models (See Diagram 1, chart 3.) This concern manufactures these three models for stock during the slack seasons, operates at nearly full

⁵ The *Literary Digest* of June 18, 1921, seems to be amused by this suggestion of reducing the variety offered in men's wear as expressed in the report of the Committee on Elimination of Waste in Industry to the American Engineering Council. It says, "The Committee, therefore, would standardize clothing style along with automobile tires," and quotes other press comment, "Let the fashions be standardized and everybody will be just as happy, the committee evidently presumes," and "But, nevertheless, we are glad that no body of men succeeded in standardizing and perpetuating the styles of the middle years of the nineteenth century, and we are quite sure that those who come after us would object mightily were they forced to adopt some of the styles in vogue in this first quarter of the twentieth.."

Those who assume that "standardization" in the sense of reducing the variety of the production means perpetuation of a few existing designs are very much mistaken. The Packard Motor Works make each year but two main designs of motor car, the six and the twin six, each with only four or five styles of body. Yet the 1921 models are not identical with those of 1920 and are superseded by slightly different models for 1922: an improvement is made in the carburetor, a line is changed slightly on the hood, and so on. So would the shifting of popular demand from one style of model to another offer clothing manufacturers opportunities to drop out an old, once popular model and substitute a new design. As for variety, we would ask the public press whether if 1,272 manufacturers of men's and young men's suits should each offer but seven models (no seven identical with any other seven, for each manufacturer has its own designer) each in 200 styles of cloth, in its opinion the resulting 1,780,800 varieties in combination of model and cloth would be insufficient for the American adult and adolescent male public!

CHART 2

CHARTS SHOWING NUMBERS OF GARMENTS IN CUTTING LOTS

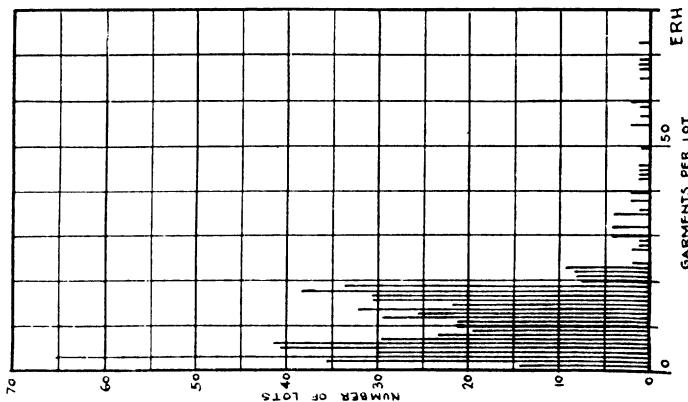


CHART 5

This manufacturer of men's and young men's sack suits offers a great variety in model and cloth style and ordinarily manufactures only to fill orders.

This policy causes production to take place in small lots as here shown. Rarely do manufacturing lots exceed 20 garments to the lot and an astonishing proportion of them are in lots of 7, 6, 5, 4, 3, and even 2 garments each. Observe that far more orders are of 3 garments each than of any other size.

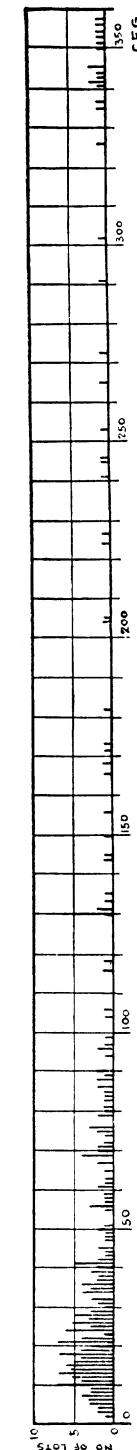


CHART 6

This manufacturer offers only 8 models of suits, each in less than 300 cloth styles. This enables him to cut in lots averaging 128 garments each. The large number of small sized lots shown on this diagram probably represent the clean up toward the end of the season.

DIAGRAM 4

CHARTS SHOWING MONTH TO MONTH FLUCTUATIONS IN TOTAL WORKING FORCES

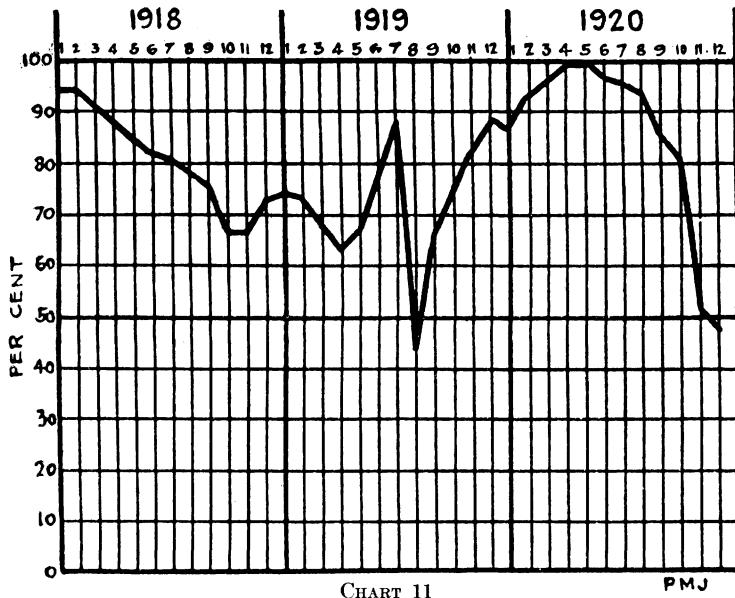


CHART 11

PMJ

This chart, which pictures the month to month fluctuations in the total working force of another clothing manufacturer, shows a slack season in October and November, 1918, another in March, April and May, 1919, and the oncoming industrial depression commencing after May, 1920.

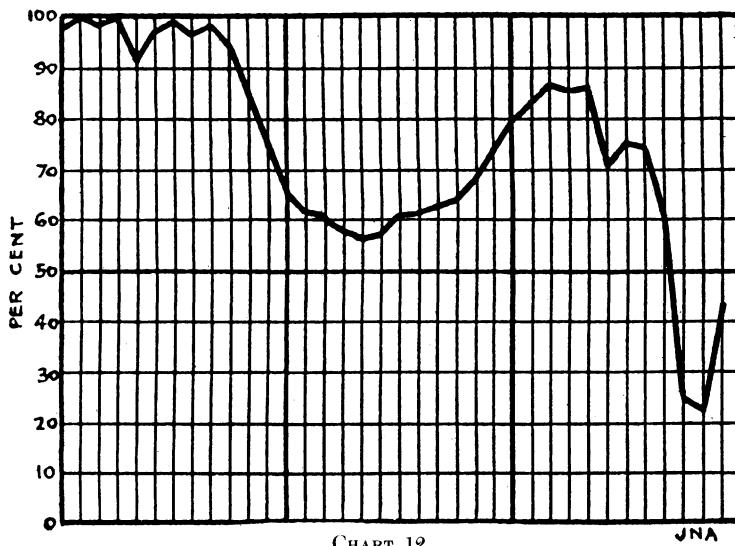
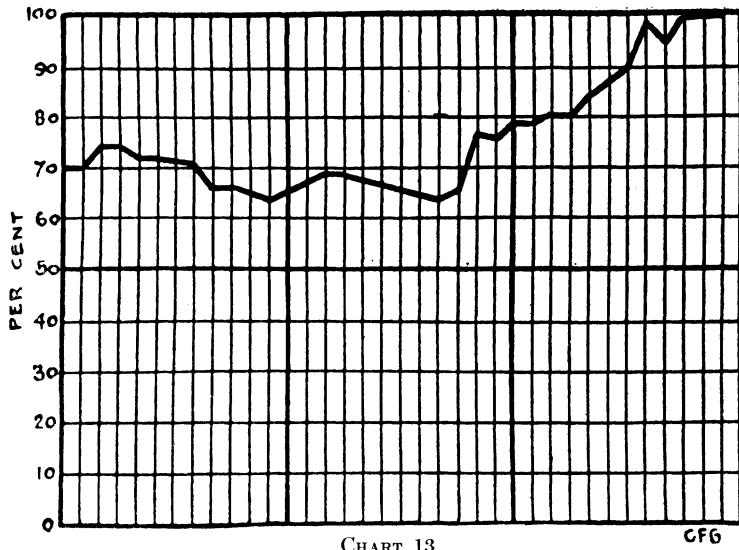


CHART 12

JNA

This chart shows the month to month fluctuations in the total number of persons on the payroll of another manufacturer of men's ready to wear clothing. It does not show the typical seasonal fluctuations in employment, but rather those longer period fluctuations due to change of status of the industry from war work in 1918 to an uncertain peace-time production after the Armistice, followed by the period of abnormal demand for clothing in the latter half of 1919 and early 1920 and culminating in the industrial depression in the latter half of 1920.

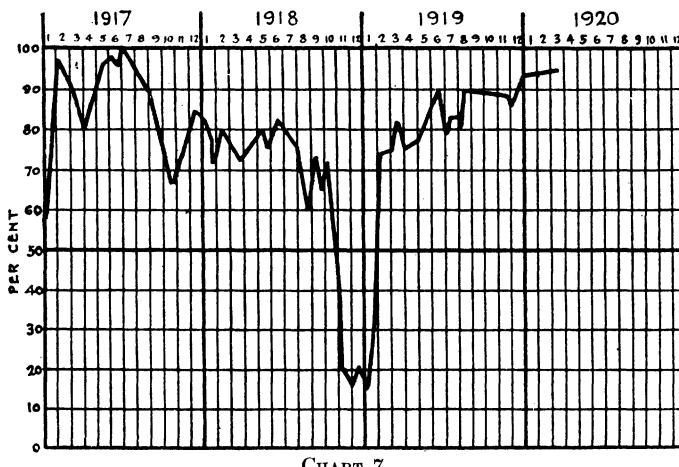


This chart shows what can be accomplished by a manufacturer who sincerely, resolutely and intelligently sets out to manufacture for stock and adopts an aggressive positive sales policy. The working force declined slightly in the latter half of 1918 and again in the latter part of 1919. But the average force is only 6% under the maximum. These declines were due to the competition of the war-working industries in 1918 and to the return of soldiers to claim their wives and sweethearts in 1919. In the latter half of 1920, when other clothing manufacturers were shutting down their factories because of industrial depression, this establishment, which is operated under scientific management, kept its force operating at nearly full capacity.

DIAGRAM 3

CHARTS SHOWING WEEK TO WEEK FLUCTUATIONS IN PERSONNEL IN CUTTING DEPARTMENTS

All garments must be "cut" before being "tailored." Hence these charts, which represent the week to week changes in the number of cutters in the employ of these clothing manufacturers, picture the pronounced seasonal character of this industry.



Composite chart showing fluctuations in twelve New York cutting departments.

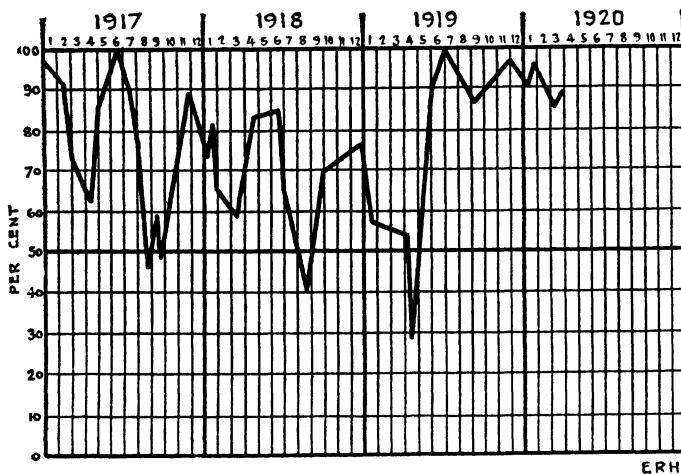


CHART 8

Fluctuations in one cutting department.

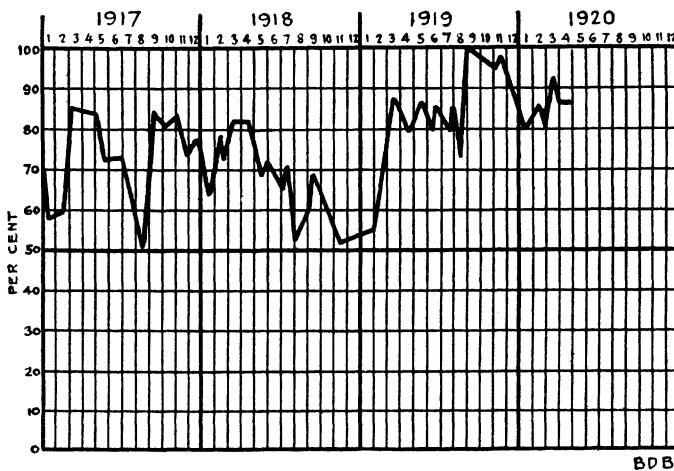


CHART 9

Fluctuations in another cutting department.

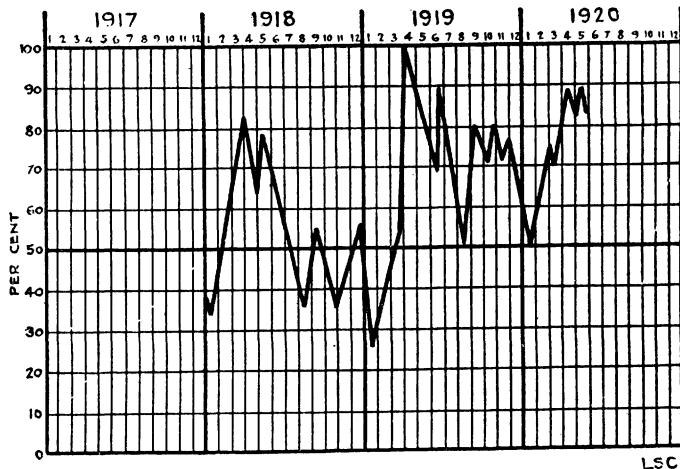


CHART 10
Fluctuations in a third cutting department.

capacity the year around (*See Diagram 4, Chart 13*), has the good-will and hearty coöperation of its employees and has all the mechanism necessary for effective, economical planning and operation of its plant.

INDUSTRIAL RELATIONS

We have spoken of the fund of industrial ill-will of the workers toward their employers that has grown largely out of the spectacular recurring seasonal unemployment. The workers also have vivid memories of the wage pittances they received in their former years of sweatshop exploitation. The result in recent years has been a rapid unionization of the industry. This has not only brought wage-rates up to proper relationship with wage-rates in other industries, and even beyond, and established the forty-four hour week, but also has done much to improve sanitation in the factories. The union policy looks toward the abolishment of the sub-contracting system.

Industrial discord is still an important source of waste. A large part of the New York market was idle during a fourteen weeks strike immediately fol-

lowing the Armistice. Unionization strikes held another group idle several weeks in the summer of 1919; likewise, a group of Chicago plants. As we write, the New York market is just resuming operations after a contest of strength, commencing officially in December, 1920 in what one party called a "strike" the other a "lock-out," to destroy the union and reestablish the open shop and piece-work. A similar contest has been going on in Boston. Since the unionization of the industry, however, official strikes have been relatively infrequent. The collective bargaining agreements forbid strikes, lock-outs and stoppages and provide impartial machinery and procedure for adjusting disputes. The higher union leaders are men of intelligence and understanding, sometimes rising to statesmanship, who act in accordance with these arrangements and do not sanction strikes and stoppages.

In most markets, however, these arrangements are still so new that neither the employees nor the employers appreciate their responsibilities under them. In wage settlements the worker concentrates his attention on the question of whether he is to get the de-

sired wage increase. As a result after the decision is rendered it never occurs to him that there were conditions subject to which the increase was granted and he overlooks his part of the bargain. In New York a seasonal wage settlement was effected in April, 1919 to endure until October 1st. New demands were presented and a new settlement effected in June to last until December 1, again in August, and again in October. In the meantime, thousands of individuals and many shops had made additional demands directly upon their employers and even been granted increases. In the official demands in August, both sides pledged themselves in advance to abide by the arbitrator's decision. He awarded a general five-dollars-a-week increase coupled with the order that no worker and no union representative should make any further individual or shop demand upon any employer during the period for which the settlement was to endure, and that no employer was to entertain any such demand if made. The award was announced at 1:30 a. m. Before 6:00 p. m. one union delegate had demanded of the employers an additional one dollar a week for the employes in six shops and had his demand granted. On the first pay day after the award, another manufacturer was greeted with a demand from his employes for an additional increase of three dollars. When reminded that they had just received a five-dollar increase they naively replied: "Oh! The union got us that. Now *you* must do something for us." The arbitrator's order was freely disobeyed by many workpeople, many union delegates and many employers. Many unofficial shop increases were granted. A number of outlaw strikes occurred in other shops to enforce demands that had been refused. This all culminated in fresh official demands in October. The employers, however,

were not without responsibility for these conditions. Not only did many of them entertain demands when made upon them, but, under the pressure of an unprecedented demand for clothing, their keen competition for labor, especially to man their new shops, advanced hiring rates higher and higher. This caused rapid migration and inequality of rates in old shops where vacancies were filled at the higher rates and adjustments were not made for the workers already there. Discontent, individual and shop demands, and further migration and general instability were the natural result.

In Chicago, where collective bargaining started in the factories of Hart, Schaffner & Marx in 1911, the leaders are more experienced and the workers are better educated concerning their responsibilities under agreements. Nevertheless stoppages are not infrequent, and, although general wage adjustments are not demanded except in the seasonal settlements, there has been, nevertheless, a continuous process of raising wage rates by the process of "nibbling" at individual piece-rates in individual factories. Apparently the same process has been going on in other markets.

This is by no means the whole story, however. The writer has listened with great interest while a union deputy took, one by one, twenty-seven cutters to task very earnestly and very forcibly for not keeping their production up to the standards agreed upon. The tailors of a certain large house compelled the cutters to coöperate with the management in working out mutually satisfactory performance standards and consented to a substantial increase in their own standards. The union has recognized the necessity of reducing production costs in both Chicago and New York, negotiating a ten per cent reduction in wage rates in the former and

a fifteen per cent reduction in the latter. In New York they have so far recognized the manufacturers' need of stabilized and dependable costs as to recede from their former attitude and negotiate shop and sectional production standards. We can expect much imperfection in the present stage of experience, but progress is being made.

Here and there manufacturing institutions, those that have passed out of the hands of their founders into those of the second generation, are feeling the need of something better than the di-

rect autocratic unsystematic management of the original proprietor, or even the mediocre systematic management that they have attained. With this in view, they have engaged management engineers to assist them onto a more scientific basis. At least five such concerns have made this move within the last two years. Although the men's and boys' ready-to-wear clothing industry has been and is still one of the worst and most wastefully managed industries in the United States, it is making progress out of that condition.

Standards for Granting Credit

By J. H. TREGOE

Secretary-Treasurer National Association of Credit Men

CREDIT is the least understood of all the elements entering into commerce. Digging under the surface of American industrial history, one must recognize that credit illiteracy has largely been responsible for both hectic flushes and serious periodic depressions.

1837 was a year made distinctive by the second of our major panics. In that year 788 state banks with a capital of 290 millions were in operation. These banks had outstanding note issues of 149 millions and loans of 525 millions. Statistics of the mercantile credits that year are not available, but the over-extended condition of the banks was indicative of a prevailing speculation in real estate, internal improvements and business generally. There was apparently no thought for the future, and the bursting of the inflated credit bubble came, no doubt, as a surprise when it could have been clearly foreseen by the careful student. Credit illiteracy prevailed at that period and the violation of fundamental credit laws produced serious reactions and disorderly liquidation.

Moving forward two decades to 1857, a year marked by the third major panic in the nation's commerce, we find that 1,416 state banks with a capital of 371 millions and deposits of 231 millions were then in operation. The total sum of specie owned by these banks amounted to 58 millions. They had outstanding note issues of 215 millions and loans of 684 millions. Once again speculation was rife and fundamental laws were being attacked at every turn. Business was in a hectic flush and the complete unsoundness of the situation was demonstrated in a serious reaction and another disorderly liquidation.

Figures are perhaps unnecessary in a review of the major panics of 1873 and 1893. It is rather toward the peculiar psychology of the panic of 1893 that attention may be turned. That panic shows very clearly a certain attitude—that Americans have too frequently rated the acquisition of things as superior to the making of standards. Removing the surface sod in an investigation of credit history, we find con-